KOLPAKOVA, T.A.; GOLIYENBIYEVSKAYA, Z.I.; SHEVTSOVA, N.I.; RYBINA, M.I.;
     NIKITINA, N.N.; RYBAKOVA, L.F.; SHIPSHINA, N.D.; KORN, A.N.; KO-
     ROVKIN, B.F.; KOSYAKOV, K.S.; STEPNAYA, A.A.

     Suggestions made at the September 29, 1963, conference of "La-
     boratornoe delo" readers, members of the Leningrad Society of Phy-
     sicians and Laboratorians. Lab. delo 10 no.4:256 '64. (MIRA 17:5)

     1. Predsedatel' pravleniya Leningradskogo obshchestva vrachey-la-
     borantov (for Kolpakova). 2. Chleny pravleniya Leningradskogo ob-
     shchestva vrachey-laborantov (for all except Kolpakova).

MALINKO, S.V.; KUZNETSOVA, N.N.; PERSIKOVA, V.N.; BELOVA, L.I.

New data on calciborite. Zap. Vses. min. ob-va 92 no.6:684-690
'63.   (MIRA 16:3)

RYBAKOVA, L. I.

Molecular state and electric conductivity of silicate melts.
A. S. Kheinman and L. I. Rybakova (Vsesoyuzn. Nauchn.-Issledovatel. Inst. Mineral. Syr'ya). Izvest. Akad. Nauk S.S.R., Otdel. Tekh. Nauk 1949, 1688-1700.—The sp. cond. of pure PbO melt and of binary melts of the system PbO-SiO$_2$ (with 30-60 mol. % SiO$_2$) are measured in the temp. range from 700 to 1050°. The high cond. of molten PbO indicates a rather high degree of ionic dissocn. of this compd. The existence of homopolar bindings in the solid crystal phase confirms the conclusion that the melts of CaO and FeO, which are ionic-bound in the crystals, are completely dissocd. Viscosity and elec. cond. of PbO-SiO$_2$ melts cannot be formulated in equations of the type η or $\kappa = A.e^{-a/RT}$; the log κ-log η relations of the investigated melts are linear. In contradiction to Evstrop'ev's and Frenkel's opinion, who ascribe to this relation only a formal analogy, the authors assume a deeper reason for the interrelations of viscosity and cond. in silicate melts if the exponential law is not followed. The curves for κ and log κ as functions of % SiO$_2$ do not show any discontinuities nor do they indicate the presence of distinct ortho- or meta-silicate mols. in the melts. Also the viscosity data do not support any theories on the mol. constitution of the liquid phases. For binary melts the authors demonstrate that the curvature of the log κ vs. 1/T curves indicates the degree of dissocn. or the homopolarity of the binding in the melt phase. This act is understood from thermodynamic reasons. The mechanism of electrolyt. dissocn. in binary salt and silicate melts is determined by the presence of homopolar bindings of the cations which bring about an increase in the exponent n of the equation $\kappa^n \eta = $ const., with the end value $n < 1$, i.e. the elec. cond. is more rapidly changing with T than η. This relation is found valid for nearly all the measured PbO-SiO$_2$ melts and brings about the conclusion that Pb is indeed partly bound by covalent forces. A slight discontinuity of the log κ vs. % SiO$_2$ curve at 36% SiO$_2$ is not explained by the presence of mols. of Pb$_2$SiO$_4$ but by that of SiO$_4$ complexes formed by a polymerization over O^{2-} anions. The assumptions of Chipman (Taylor and C., C.A. 36, 6975^4), Winkler and C., C.A. 40, 3083^4, and Grant and C., C.A. 40, 3083^5 are refuted; there are no reasons for assuming assocns. of fused Ca silicates, phosphates, ferrites, and aluminates, and those assumptions are not based on correct data on the real mol. constitution of slag melts.

W. Eitel

USSR/Physics - Crystallography   1 Jul 53

"Mechanism of Additive Coloring of Alkali-Halide
Crystals," L. M. Shamovskiy, L. I. Rybakova and
M. I. Gosteva, All Union Sci-Res Inst of Minerals

DAN SSSR, Vol 91, No 1, pp 67-70

Demonstrate that location and shape of F-band and
max concn of F-centers do not depend on type of
alkali metal, if the coloring process is performed
under satd vapors of this metal. Presented by
Acad A. N. Terenin, 12 May 53.

266T99

Rybakova, L. I.

13287*   (Russian.) A Study of the Palladium-Copper-Cobalt System. Issledovanie sistemy palladii-med'-kobal't. A. T. Grigor'ev, L. A. Panteleimonov, V. V. Kuprina, and L. I. Rybakova. Zhurnal Neorganicheskoi Khimii, v. 1, no. 5, 1957-1070 + 1 plate.

Thermal analysis; determination of micro-structure after annealing, Brinell hardness, and specific resistance and its temperature coefficient. Mutual solubility of Cu and Co increases with increasing Pd content.

40581

S/137/62/000/008/022/065
A006/A101

II. 3900

AUTHORS: Badayeva, T. A., Rybakova, L. I.

TITLE: Joint solubility of thorium and uranium in liquid bismuth

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 8, 1962, 20 - 21, abstract
81132 (In collection: "Stroyeniye splavov nekotorykh sistem s
uranom i toriyem", Moscow, Gosatomizdat, 1961, 416 - 422)

TEXT: The authors studied the joint solubility of Th and U in liquid Bi
in a 300 to 1,000°C temperature range. Bi 99.999%, Th 99.7% and U 99.83% were
used as initial materials. In the method employed to determine solubility, the
liquid and solid phases, being in equilibrium at a given temperature, were
separated by pouring-off the liquid phase under the experimental conditions; the
liquid phase was then chemically analyzed. A schematic diagram is presented of a
device to determine Th and U solubility in liquid Bi. A microscopical analysis
of the residue of the solid phase was carried out after pouring-off the liquid
phase. At 300°C only traces of Th and about 0.1 at. % U were detected in liquid
Bi. With elevated temperature the joint solubility of Th and U in liquid Bi

Card 1/2

Joint solubility of...

S/137/62/000/008/022/065
A006/A101

increased and at 1,000°C was equal to 4.1 at. % Th and 7.5 at. % U. In the 300 -
1,000°C temperature range, ternary liquid solutions of Bi with Th and U are in
equilibrium with solid phases: $ThBi_2$, $ThBi_2 + UBi_2$, UBi_2.

Z. Rogachevskaya

[Abstracter's note: Complete translation]

Card 2/2

RIBAKOVA, L. I.

svoystva splavov uu, iya i osimostya; torne ststa
and Properties of Uranium, Thorium, and Zirconium
loys; llection of Articles) Moscow, Gosatomizdat, 1963.
000 copies printed.
yeva, T. A., and G. K. Alekseyenko. Structure of
loys of the Thorium-Zirconium-Niobium System

Badeyeva, T. A., and G. K. Alekseyenko. Corrosion Prop-
erties of Thorium-Zirconium-Niobium Alloys

yeva, T A.,and L. I. Rybakova. Structure of $ThSi_2-US$
lloys

PART III. ZIRCONIUM-BASE ALLOYS

ayeva, T. A., and L. I. Rybakova. Structure of Binary
conium-Bismuth and Zirconium-Lead Alloys in the Solid
State

Terekhov, G. I., and O. S. Ivanov. Phase Diagram of the
Zirconium Corner of the Zirconium-Chromium-Tin System   309

Card 8/10

KOSTYUKOVA, Ye.P.; ROVINSKIY, B.M.; RYBAKOVA, L.M.

Structural changes in metals under the effect of alternating plastic
deformations. Fiz. met. i metalloved. 20 no.2:274-279 Ag '65.
(MIRA 18:9)

1. Institut mashinovedeniya, Moskva.

RYBAKOVA, L.M.; NIKITINA, I.I.

Investigating temporary strength dependence of alloys of nickel and copper with aluminum. Fiz. met. i metalloved. 16 no.1:107-112 Jl '63.
(MIRA 16:9)

(Nickel-aluminum alloys--Testing)
(Copper-aluminum alloys--Testing)

RYBAKOVA, L. M.

Investigation of crystallite structures in non-deformed metals. B. M. Rovinskii and L. M. Rybakova. *Izvest. Akad. Nauk S.S.S.R., Ser. Fiz.* 15, 87–95(1951).—Four types of crystallites are considered: (1) perfectly shaped crystal, (2) elastically deformed convex or concave crystal, (3) crystallite contg. small domains with a small slippage angle between them, formed according to some rule, (4) same as (3) but the distribution is given by the laws of hazard. Formulas are developed for the size of interference spots for all 4 types of crystallites as a function of conditions during the radiography. A method has been worked out to use 2 perpendicular slits made in 0.1 mm. Ta foil and used in an ionic demountable tube with a Co anode. Measurements made on 09.09% pure Al and tech. W show that the crystals belong to type 2 with R_{Al} (radius of curvature) = 16.6 mm. and R_W = 10.6 mm., δ_{Al} (angle of imperfection) = 42.5, δ_W = 36.5. The radius R depends linearly on the size of the recrystd. crystals. Many interference spots show complex structure indicating a secondary mosaic structure. S. Pakswer

Inst. Machine Construction, AS USSR

RYBAKOVA, L. M.   PA 243T53

USSR/Metallurgy - Steel, Crystal Analysis   Oct 52

"Breaking Down of Crystal Blocks and Development of
Microstresses in Metal During Plastic Deformation,"
B. M. Rovinskiy, L. M. Rybakova

"Iz Ak Nauk, Otdel Tekh Nauk" No 10, pp 1483-1488

Using X-ray method, investigates processes in metals
during plastic deformation. Established breaking
down of crystal blocks in steel specimen under tension.
This process, intensive in beginning, is further re-
tarded and discontinued at residual deformation of
about 12%. Discusses microstresses developed in metal
as result of breaking down of crystal blocks, dimen-
sions of crystal blocks, and non-uniformity of lattice
period. Submitted by I. A. Oding, Corr Memb, Acad Sci
USSR, 15 Jan 52.   243T53

Ryban... L. M.

3063. Rovinskil, B. M., and Rybakova, L. M., Structural changes in metals under conditions of creep (in Russian), *Izv. Akad. Nauk SSSR Otd. tekh. Nauk* no. 9, 1241-1247, 2 plates, Sept. 1953.

Investigation was conducted for different residual deformations. Armco Iron (at 400 and 450 C) and EIa-1T Steel (at 575 and 625 C) were used. Analysis of structural changes in crystal grains by quantitative methods alone do not sufficiently reveal the peculiarities to differentiate creep from plastic deformation. Authors used qualitative analysis by x ray. They provided detailed description of the methods and made the following observations. Qualitatively the structural changes produced by creep are analogous to those due to plastic deformation. The changes which correspond to the same residual deformation, in both processes, become less obvious as temperature increases. Results of investigation of the crystal lattice deformation and the development of the microstresses under creep appear to support the conclusions which are based on the comparison of the structural changes due to creep and plastic deformation. Lattice deformation and microstresses occur as residual deformation increases. This is observed under creep as well as under plastic conditions. As temperature increases these processes are slower for creep. Considerably slowed down is the deformation of the lattice pattern.   V. A. Valey, USA

RYBAKOVA, L. .

"X-Ray Analysis of Structural Changes in Polycrystalline Metals
During Creeping." Cand Tech Sci, Inst of Metallurgy, Acad Sci
USSR, Moscow, 1954. (RZhFiz, Mar 55)

SO: Sum. No. 670, 29 Sep 55-Survey of Scientific and Technical
Dissertations Defended at USSR Higher Educational Institutions(15)

Rybakova, L. M.

USSR/Metallurgy - Stresses in metal crystals

FD-1011

Card 1/1   : Pub. 153 - 15/24

Author   : Rovinskiy, B. M., and Rybakova, L. M.

Title   : Magnitude of the crystalline blocks and of the initial micro-stresses
                   in nondeformed metals

Periodical   : Zhur. tekh. fiz., 24, 1069-1076, Jun 1954

Abstract   : Determine the magnitude of blocks by using inverted x-ray photographs
                   in the camera with special slit device which give a very narrow beam of
                   rays with small divergence and fine focussing. As a consequence, the
                   width of the interference lines are practically independent of gemetric
                   conditions. By this method, various well annealed metals (steel 15 and
                   48, aluminum, wolfram) are investigated and results tabulated. Conclude
                   from interference spots and lines that nondeformed metals the crystals
                   are a mass of simias blocks or are a combination of extremely few blocks.

Institution   : -

Submitted   : August 10, 1952

RYBAKOVA, L.M.

*Breaking Down of Crystal Blocks and Appearance of
Microstresses in the Metal During Plastic Deformation. B. M.
Rovinsky and L. M. Rybakova ([U.S.] Nat. Advis. Ctte.
Aeronautics, Unpublished Paper 1955, (N-37216), 7 pp.)—
Translated from Izvest. Akad. Nauk S.S.S.R., 1952, [Tekhn.],
1433-1437.—I. S. S.

RYBAKOVA, L. M.

The change of aluminum substructure at a small plastic deformation.

/Ra-
MT
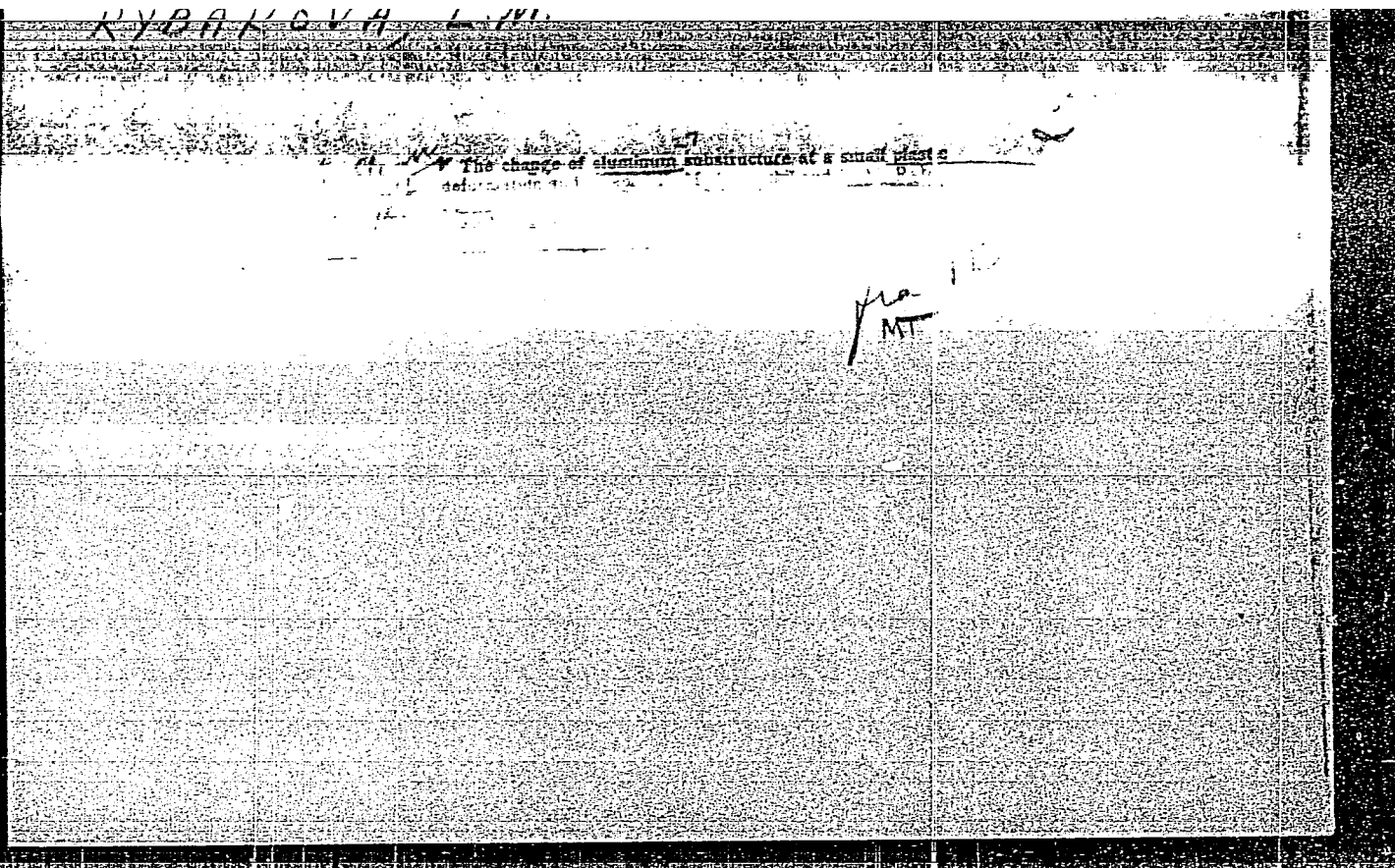
K YEHKEiH Z.M.

USSR / Structure of Deformed Materials.   E-8

Abs Jour   : Ref Zhur - Fizika, No 4, 1957, No 9387

Author   : Rovinskiy, B.M., Rybakova, L.M.
Inst   : Institute of Machinery Research, Academy of Sciences USSR
Title   : Change in Substructure of Aluminum at Small Plastic Defor-
              mation and in Creep.

Orig Pub   : Izv. AN SSSR, ser. fiz., 1956, 20, No 6, 646-649

Abstract   : Results are given on a detailed qualitative X-ray analy-
              sis of the variation in the substructure of large grain
              pure aluminum upon small plastic deformation under condi-
              tions of simple tension and creep at room temperature. The
              procedure used in the work was described by the authors
              earlier (Izv. AN SSSR, ser. fiz., 1951, 15, 87). The in-
              vestigation was carriedout in apparatus for small stret-
              ching of the specimen and for creep directly on a table of
              a dismountable ionic X-ray tube. Using a collimation de-

Card   : 1/2

E-8

USSR / Structure of Deformed Materials.

Abs Jour   : Ref Zhur - Fizika, No 4, 1957, No 9387

Abstract   : vice in the form of two mutually perpendicular slits 0.04
              mm wide at a length of 4.0 mm there were obtained on the
              X-ray photographs cross-like interference spots with high
              resolution (approximately one minute). The authors deter-
              mined the number of blocks in the crystallite, the angle of
              their mosaic structure, and the shift of the interference
              spots during the process of plastic deformation and creep.
              Analysis of the interference pattern has shown that the
              structural changes occurring inside the crystallite during
              the creep process are analogous to the structural changes
              occurring in simple tension. It is shown that with time
              the elements of the substructure become disoriented, are
              fractionalized and shift to each other. Simultaneously and
              independently of the structural changes, occurring inside
              the crystallites, the crystallites themselves are shifted
              relative to each other. This process, in the authors' opi-
              nion, is analogous to viscous flow along the grain bounda-
                                                              ries.

Card   : 2/2

ΛΙΒΛΚΙΙΗ, Ι. Μ

USSR / Structure of Deformed Materials.   E-8

Abs Jour   : Ref Zhur - Fizika, No 4, 1957, No 9388

Author   : Rybakova, L.M.
Inst   : Institute of Machinery Research, Academy of Sciences USSR
Title   : X-ray Analysis of Structural Variations in Metals in Creep.

Orig Pub   : Izv. AN SSSR, ser. fiz., 1955, 20, No 6, 676-678

Abstract   : Report on the results of X-ray diffraction investigation of structural changes in creep of low-carbon steel at 450° with a velocity of deformation of 10^{-2} -- $10^{-3}\%$ per hour. The structural changes in creep are compared with the changes upon deformation with an ordinary rate at room temperature and at higher temperatures. Tests were carried out on standard round specimens, stretched to a deformation of approximately 12%. Experiments on tension and creep were interrupted for the X-ray-diffraction analysis. The X-ray patterns were

Card   : 1/2

USSR / Structure of Deformed Materials.   E-8

Abs Jour   : Ref Zhur - Fizika, No 4, 1957, No 9388

Abstract   : obtained in a back-reflection camera with cobalt radiation.
              It was established that the region of the unsteady creep is
              accompanied by a smearing of the interference spots, and the
              region of the second section is accompanied by equalization
              of the intensity over the ring. It is concluded that in
              creep, particularly during the first period, the processes
              that take place are analogous to those observed upon defor-
              mation with ordinary velocity, i.e., crumbling and accumula-
              tion of microstresses. In the second period, an important
              role is played by the displacement of the elements of the
              substructure. It is also noted that in quantitative rela-
              tionship the structural changes, estimated from the smearing
              of the interference spots, are considerably smaller than in
              simple tension.

Card   : 2/2

AUTHORS: Rovinskiy, B.M. and Rybakova, L.M. (Moscow)

SOV/24-58-4-18/39

TITLE: The Relationship Between Crystal Size and Yield Point and Metal Hardness (O zavisimosti predela tekuchesti i tverdosti metalla ot velichiny blokov)

ABSTRACT: A study is made of the effect of size (ε) of the crystal grains and non-uniformity ($\eta = \Delta d/d$) of the interplanar distance in the crystal lattice during permanent deformation on yield point (σ_s) and Brinell hardness (H_B) of metals. The experimental data used in the study have been taken from an earlier investigation by the present authors and from investigations by other authors, in particular Ball (Ref 1) and Hall (Ref 5). The data are for a low-carbon steel and pure aluminium. The various data for σ_s and H_B are plotted against $\eta^{1/2}$ and $\varepsilon^{-1/2}$ and the plots are found to be straight lines. The authors' straight line for σ_s versus $\varepsilon^{-1/2}$ passes through the origin of the co-ordinate system, indicating that σ_s approaches zero as the grain size

Card1/3

The Relationship between Crystal Size and Yield Point and Metal Hardness

SOV/24-58-4-18/39

increases. Hall's straight line is criticised for not passing through the origin and it is suggested that this line could be made to do so and still pass through the experimental points.

The fact that the plot of σ_s vs. $\eta^{1/2}$ is also a straight line passing through the origin is used to conclude that $\varepsilon\eta = const.$ Doubts are expressed regarding the validity of the general view that the development of non-uniformity of lattice parameters during plastic deformation of metal is caused by the development of micro-stresses. It is further argued that Hall's view that the mosaic structure of grains is not affected by their size is incorrect.

The plots of H_B vs. $e^{-1/2}$ and H_B vs. $\eta^{1/2}$ are straight lines intersecting the axis of ordinates at a point $H_{B(0)}$ above the origin. From the various curves a relationship is derived for H_B and σ_s :

Card2/3

SOV/24-58-4-18/39

The Relationship Between Crystal Size and Yield Point and Metal Hardness

$$H_B = H_{B(0)} + C\sigma_s$$

where $C = \varepsilon^{1/2} \eta^{1/2} k$ and k is a constant depending on units.

There are 1 figure and 7 references, 1 of which is Soviet and 6 English.

ASSOCIATION: Institut mashinovedeniya AN SSSR (Institute of Mechanical Engineering of the Ac. Sc. USSR)

SUBMITTED: January 20, 1958

Card 3/3

SOV/126-6-5-17/43

AUTHORS: Rybakova, L.M., and Rovinskiy, B.M.

TITLE: Structural Changes in Metals During Very Small Rates of
            Deformation (O strukturnykh izmeneniyakh v metallakh pri
            ochen' malykh skorostyakh deformirovaniya)

PERIODICAL: Fizika Metallov i Metallovedeniye, 1958, Vol 6,
            Nr 5, pp 874 - 878 (USSR)

ABSTRACT: The difference between structural changes taking place
            during creep and those due to deformation in tensile
            tests is quantitative in nature. Work done in the past
            on the change in structure in relation to rate of defor-
            mation includes electron microscopic investigations of
            slip lines in monocrystals of aluminium deformed at
            different rates (Ref 2). Polycrystalline material was
            investigated by Pashkov (Ref 3). An X-ray investigation
            of the influence of the rate of deformation has been
            carried out by Braudenberger (Ref 4). Davidenkov (Ref 5)
            investigated the structural changes in steel and copper
            specimens which had been statically and dynamically
            compressed. All these investigations, however, are
            concerned only with static and dynamic deformation. Only
            recently has the influence of a deformation rate 40 to

Card1/3

SOV/126-6-5-17/43

Structural Changes in Metals During Very Small Rates of Deformation

50 times less than static been investigated (Ref 7). The results of this investigation do not agree with the known experimental facts. In Figures 1 and 2 the change of the half-length of the interference line for Steel 40 and Ni in relation to the extent of total deformation at normal and very low deformation rates is shown by crosses and points, respectively. In Figures 3 and 4, four sets of X-ray photographs are shown, two for Steel 40 and two for Ni of specimens deformed in accordance with the strain curves of Figures 1 and 2 (i.e. at normal and slow rates of deformation). Whereas, in undeformed specimens the interference spots appea- clearly defined with progressive deformation they become diffuse, the diffuseness increasing more rapidly with normal rates of deformation than with slow rates. The lower degree of diffuseness obtained with slow deformation is due to relaxations of micro-stresses within the grains accompanying slow deformation and is brought about by mutual displacement of grains or grain fragments. Such displacement has been observed in plastic deformation as well as in creep (Ref 8). In order to elucidate this phenomenon more fully, a microscopic

Card2/3

SOV/126-6-5-17/43

Structural Changes in Metals During Very Small Rates of Deformation

investigation using the scratch method was carried out
in which the specimens were scratched in a direction
perpendicular to that of deformation. Micro-photographs
of   slowly deformed specimens showed scratch fractures in
the grain boundaries and slip lines in grain bodies more
clearly than those of rapidly deformed ones, thus confirming
earlier reports of displacement of grains and grain
fractures.   There are 4 figures and 9 references, 7 of
which are Soviet and 2 German.

ASSOCIATION: Institut mashinovedeniya AN SSSR
               (Institute of Machine Theory of the Ac.Sc.USSR)

SUBMITTED: February 18, 1957

Card 3/3

7(6), 18(3)

AUTHOR: Rybakova, L. M.   SOV/32-24-11-22/37

TITLE: New Methods of Applying Graduation Grids on Samples (Novyy
              metod naneseniya delitel'nykh setok na obraztsy)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol 24, Nr 11, pp 1392-1394
              (USSR)

ABSTRACT: In testing plastic deformations the surface of the body to be
              deformed is covered by a graduation in the form of a grid the
              changes of which permit the determination of the deformation
              of the entire body. The method described makes it possible
              to apply micro-grids of a base of less than 0.1 mm. In de-
              veloping the method suggestions of B. M. Rovinskiy were
              followed. A metallic net of the desired number of meshes is
              placed on the prepared surface of the sample. The metal is
              put in its place in a device (Sketch) which is used in
              electronic microscopy for the application of metals and other
              substances in the vacuum. At the same time a metal evaporates
              from a glowing tungsten spiral (through which an electrical
              current is led) into a vacuum of about 10^{-5} mm mercury. The
Card 1/2   evaporated metal sublimes on the surface of the sample only in

SOV/32-24-11-22/37

those places where the metal grid does not cover it. The grid be-
ing removed the surface of the sample shows the structure of
the grid. In this manner grid structures are produced by
evaporating gold, antimony and other high-melting-point metals.
It is recommended to apply metals the colors of which differ
from that of the surface to be tested.
There are 2 figures and 4 Soviet references.

ASSOCIATION: Institut mashinovedeniya Akademii nauk SSSR (Institute of
Mechanical Engineering of the Academy of Sciences, USSR)

Card 2/2

L 20726-66   EWP(k)/EWT(m)/EWP(t)   JD/HW

ACC NR: AP6011998   SOURCE CODE: UR/0126/65/019/004/0596/0601

AUTHOR: Rovinskiy, B. M.; Rybakova, L. M.

ORG: Institute of Machine Science, Moscow (Institut mashinovedeniya)

TITLE: Width of diffraction lines on x-ray diffraction patterns of cold-deformed metals

SOURCE: Fizika metallov i metallovedeniye, v. 19, no. 4, 1965, 596-601

TOPIC TAGS: x ray diffraction analysis, elastic deformation, material deformation, flow stress

ABSTRACT: An approximate dependence of the true width of diffraction lines on the block size ε and non-homogeneous elastic deformation of the lattice η is obtained, where $\varepsilon\eta=$const $(0 < \varepsilon \eta < d)$. It is shown that the true line width on X-ray diffraction patterns of cold-deformed metals is in direct relationship to the residual deformation and the true flow stress (for single-axis extension). Orig. art. has: 2 figures, 10 formulas, and 1 table. [JPRS]

SUB CODE: 20, 11 / SUBM DATE: 22Jan64 / ORIG REF: 005 / OTH REF: 003

Card 1/1   UDC: 539.292; 548.4

L 24471-66   EWT(m)/EWP(w)/T/EWP(t)   IJP(c)   JD/GS
ACC NR: AT6010574   (N)   SOURCE CODE: UR/0000/65/000/000/0054/0063

AUTHOR: Rybakova, L. M.; Merenkova, R. F.; Rovinskiy, B. M.

ORG: State Scientific Research Institute of the Science of Machines (Gosudarst-vennyy nauchno-issledovatel'skiy institut mashinovedeniya)

TITLE: Electron microscopic and metallographic analysis of the nature of structural fractures during cyclic deformation

SOURCE: AN UkrSSR. Mekhanizm plasticheskoy deformatsii metallov (Mechanism of the plastic deformation of metals). Kiev, Naukova dumka, 1965, 54-63

TOPIC TAGS: copper, iron, cyclic test, material deformation

ABSTRACT: The authors study the kinetics of structural changes which take place within a metal subjected to cyclic deformation. Electron and optical microscopes were used for the study. Copper and Armco iron specimens were studied. The copper specimens were subjected to pulsating cyclic deformation with a constant deformation amplitude of 1%. The specimens were tested to complete fracture (600 cycles) and up to a given number of cycles (1, 2, 3, 10, 50, 150 and 400) at a loading frequency of 12 cycles per minute. The iron specimens were tested by a method described in

Card 1/2

L 24471-66

ACC NR: AT6010574

another work (Rovinskiy, B. M., Rybakova, L. M., Izv. AN SSSR, metally, 1965, 5, 3) with a deformation amplitude of 4%. Isolated pores and cracks are observed in the earliest stages of cyclic deformation (1 or 2 cycles). Damage at this stage of deformation has no effect on the mechanical behavior of the specimen as a whole. After 10 cycles, the copper specimen shows localized fractures where three grains meet and between a twin layer and the boundary of the adjacent grain. A photomicrograph of a specimen after 50 cycles of deformation shows a marked tendency for individual micropores to fuse into cracks along grain boundaries, especially adjacent to twins. The part played by twin boundaries in cyclic deformation is discussed. A network of fractured grain boundaries is observed after 150 cycles. No slip lines or fractures are observed within the grains themselves until approximately 2/3 of the fracture life of the specimen. The structure shows signs of fracturing in zones of stable slipping after 400 cycles. The density of iron specimens decreases during cyclic deformation reaching a value of 0.03 g/cm^3 at the end of the second stage. The fracture surface has a typical fatigue structure with two zones: zones of fast and slow propagation of the main crack. Orig. art. has: 6 figures.

SUB CODE: 11/ SUBM DATE: 05Sep64/ ORIG REF: 002/ OTH REF: 005

Card 2/2 dda

L 1354-66   EWT(d)/EWT(m)/EWP(w)/EWP(t)/EWP(b)   IJP(c)   EM/JD

ACCESSION NR: AP5021937

UR/0126/65/020/002/0274/0279

539.292; 548.4

AUTHOR: Kostyukova, Ye. P.; Rovinskiy, B. M.; Rybakova, L. M.

TITLE: Structural changes in metals in the presence of cyclic plastic deformation

SOURCE: Fizika metallov i metallovedeniye, v. 20, no. 2, 1965, 274-279

TOPIC TAGS: metal structure, cyclic deformation, plastic deformation, interference spot, crystallite, azimuthal interference spot width, reflecting crystal, dislocation structure, irreversible structural change, reversible structural change

ABSTRACT: Small rectangular plates of ultrapure aluminum (99.996%), were cold-worked, annealed for 2 hr at 550°C in a vacuum and then bent in one direction, straightened out, bent in an opposite direction, and again straightened out (a symmetric cycle). The attendant changes were examined by investigating the variation in interference spots on the roentgenograms of individual crystallites

Card 1/3

L 1354-66

ACCESSION NR: AP5021937

in the aggregate. It was found that the azimuthal width of the interference spots is to some extent reversible in cyclically deformed specimens, which indicates an increase in the degree of perfection of the reflecting crystal and hence also a partial return of its dislocation structure to the original state. As the number of deformation cycles increases, the irreversible component of structural changes increases due to a steady increase in the degree of the blocking of dislocations. A second series of experiments dealt with the cyclic alternated (pulsating) compressive and tensile deformations of specimens of commercial iron and copper, the purpose this time being to determine the variation in the true width of the diffraction lines, and they revealed that in the presence of cyclic deformation this width not only does not decrease but even increases. This is apparently conditioned by the partial back-movement of the dislocations and their partial absorption by the sources. As a deformation cycle is reversed from one pole to the other, the angle of disorientation (flaw in the reflecting grain) in the crystallites of metals (aluminum, iron) decreases. Structural changes of an irreversible nature in unidirectional plastic deformation are greater than in arithmetically balanced cyclic plastic deformation. Orig. art. has: 5 figures, 1 formula.

Card 2/3

L-1354-66

ACCESSION NR: AP5021937

ASSOCIATION: Institut mashinovedeniya, Moscow (Institute of Mechanical Engineering)

SUBMITTED: 11Jul64   ENCL: 00   SUB CODE: SS, MM

NO REF SOV: 010   OTHER: 010

Card 3/3

ROVINSKIY, B.M. (Moskva); RYBAKOVA, L.M. (Moskva)

Stresses, deformations and structural changes in commercial iron
during cyclic plastic deformation. Izv. AN SSSR. Met. no.3:101-112
My-Je '65.   (MIRA 18:7)

ROVINSKIY, B.M.; RYBAKOVA, L.M.

Width of the diffraction lines on X-ray patterns of strain-hardened metals. Fiz. met. i metalloved. 19 no.4:596-601
Ap '65.   (MIRA 18:5)

1. Institut mashinovedeniya, Moskva.

ROVINSKIY, B.M.; RYBAKOVA, L.M.

Investigating the dependence of mechanical properties on the characteristics of metal structure. Fiz. met. i metalloved. 17 no.4:554-563 Ap '64. (MIRA 17:8)

1. Institut mashinovedeniya, Moskva.

RYBAKOVA, L. M.

by Z. G. Pinsker ("Basis of diffractional methods of investigation of perfect crystals"), B. M. Rovinskiy and L. M. Rybakova ("Investigation of dependence of mechanical properties on characteristics of structure of metals"-), L. M. Utevskiy and P. M. Usikov ("Application of microscopy in investigation of structure of alloys"), A. A. Predvoditelev and N. A. Tyapunina ("Role of reproduction of dislocations in process of plastic flow"), A. V. Pertsov, N. V. Pertsov and E. D. Shukin "Self-producing internal dispersion of metals under action of strongly superficially-active metallic melting") and I. L. Mirkin ("Problems of structural investigations, advanced by requirements of progress of technology").

reports presented at the 3rd Intervuz Conference on Strength and Ductility of Metals, Petrozavodsk State University, 24-29 June 1963.
(reported in Fizika Metallov i Metallovedeniye, Vol. 16, No. 4, 1963, p 640.
JPRS 24,651   19 May 1964.

ROVINSKIY, B. M. and RYBAKOVA, L. M.

"Study of Dependence of Mechanical Properties on Metal Structure Characteristics."
report presented at the 3rd Conference of Higher Educational Institutes on Strength
and Plasticity of Metals, Petrozavodsk State University, 24-29 June 1963.

ROVINSKIY, B.M. (Moskva); RYBAKOVA, L.M. (Moskva)

Stresses and irreversible deformations in plastic metals caused by simple stretching. Izv.AN SSSR.Otd.tekh.nauk,,Mekh.i mashinostr. no.5: 68-74 S-O '62.
(MIRA 15:10)
(Strains and stresses) (Deformations (Mechanics))

RYBAKOVA, L.M., inzh.; MERENKOVA, R.F., inzh.

Yield points in commercial-grade nickel. Metalloved. i term.
obr. met. no.1:29-30,35 Ja '63.   (MIRA 16:2)

1. Institut mashinovedeniya Gosudarstvennogo komiteta
Soveta Ministrov SSSR po avtomatizatsii i mashinostroyehiyu.
                    (Nickel—Testing)
                    (Strains and stresses)

L 10138-63   EWP(r)/EWT(d)/EWT(m)/BDS

ACCESSION NR: AP3000900   S/0179/63/000/002/0184/0187

AUTHOR: Rovinskiy, B. M.; Rybakova, L. M. (Moscow)

TITLE: On the relation between the hardness and the true stresses and the residual deformation under simple tensile stretching.

SOURCE: AN SSSR. Izv. Otd. tekh. nauk. Mekhanika i mashinostroyeniye, no. 2, 1963, 184-187

TOPIC TAGS: hardness, true stresses, residual deformation, simple tension, simple stretching, Cu, Al, Ni, Armco Fe, Steel 45, hardness vs. true stresses, hardness vs. residual deformation, Brinell testing

ABSTRACT: This report on the results of an experimental program refers to the authors' studies (Akad. nauk SSSR, Izv., Otd. tekh. nauk., Mekhanika i mashinostroyeniye, no. 5, 1962, 68, and ibid., no. 4, 1958, 100) in which it was shown that there is a relationship between the true stresses in specimens made of plastic metals under simple tension at a prescribed stretching rate and the irreversible residual deformation, and also a linear relationship between the

Card 1/3

L 10138-63

ACCESSION NR: AP3000900

hardness of the metal thus deformed, as established by means of the Brinell indentation test, and the true stress and the residual deformations. Tests ere made with MO copper, AO aluminum, NO nickel, Armco iron, and Steel 45. These materials were tested after various types of heat treatment (all specified). Hardness-versus-true-stress diagrams were constructed. The diagrams confirm the relationship previously obtained from X-ray investigations. It is noted that aluminum, iron, and Steel 45 exhibit two differently sloping rectilinear segments in the graphs; the discontinuity points between these segments confirm previously obtained experimental data. The hardness-versus-residual deformation to the 0.5 power exhibit single straight-line graphs. The present paper does not develop the problem of the discontinuity between the two straight-line segments in the hardness-vs.-true-stress diagrams any further leaves this to a subsequent specialized study. The specific value of the slope of the hardness-vs. ture-stress lines is examined, and it is concluded that their slope is a direct function of the method of the hardness measurement. There are 6 numbered equations, 6 figures, and 1 table.

Card 2/3

L 10138-63
ACCESSION NR: AP3000900

ASSOCIATION: none

SUBMITTED: 07May62   DATE ACQ: 12Jun63   ENCL: 00

SUB CODE: MD,AP,MA   NR REF SOV: 003   OTHER: 000

Card 3/3

RYBAKOVA, L.M.; YERMOL'CHIK, S.Z.

Investigating the substructure od copper annealed at various temperatures. Fiz.met.i metalloved. 15 no.3:439-443 Mr '63.
(MIRA 16:4)

(Copper—Metallography)   (Annealing of metals)

ROVINSKIY, B.M. (Moskva); RYBAKOVA, L.M. (Moskva)

Relation of hardness, actual flow stresses and residual deformation in case of a simple stretching. Izv. AN SSSR Otd. tekh. nauk. Mekh. i mashinostr. no.2:184-187 Mr-Ap '63.
(MIRA 16:6)

(Strains and stresses)

ROVINSKIY, B.M.; RYBAKOVA, L.M.

Time strength relation in dynamic tension. Fiz. met. i metalloved.
9 no. 4:598-605 Ap '60.
(MIRA 14:5)

1. Institut mashinovedeniya AN SSSR.
        (Strains and stresses) (Creep of metals)

ROVINSKIY, B.M.; RYBAKOVA, L.M.

Effect of preliminary cyclic heat treatment and plastic deformation
on metal strength and durability. Fiz. met. i metalloved. 9
no. 4:606-612 Ap '60.   (MIRA 14:5)

1. Institut mashinovedeniya AN SSSR.
        (Copper—Heat treatment) (Copper—Fatigue)

RYBAKOVA, L.M.; YERMOL'CHIK, S.Z.

Porosity development in copper under the effect of cyclic
heat treatment. Fiz. met. i metalloved. 9 no.5:733-740
My '60.   (MIRA 14:4)

1. Institut mashinovedeniya AN SSSR.
        (Copper—Metallography)
        (Thermal stresses)

33907
S/640/61/000/000/028/035
D205/D302

21.2100

AUTHORS: Badayeva, T. A. and Rybakova, L. I.

TITLE: Simultaneous solubility of thorium and uranium in
             liquid bismuth

SOURCE: Akademiya nauk SSSR. Institut metallurgii. Stroyeniye
             splavov nekotorykh sistem s uranom i toriyem. Moscow,
             Gosatomizdat, 1961, 416-422

TEXT: A hot decantation method for separating the solid and li-
quid phases was adopted. The contacting apparatus is described in
considerable detail. All the contacting, separating and cooling
operations were performed in argon. Chemical analysis of the de-
canted liquid phase gave the equilibrium composition at the ex-
perimental temperature. Bi of 99.999% purity, Th 99.7% and U
99.83% (containing 0.12% carbon) were employed. The simultaneous
solubilities of Th and U in Bi were determined at 300, 550, 600,
700, 750, 800, 850, 900, 950 and 1000°C. The results are tabula-
ted and represented graphically. The simultaneous solubility of

Card 1/2

33907
S/640/61/000/000/028/035
D205/D302

Simultaneous solubility of ...

Th and U in Bi does not differ much from the additive solubility.
At 300°C only traces of Th and ~0.1% U are soluble in the liquid
Bi. At 1000°C the limiting value of solubility is 4.1 at.-% Th
and 7.5 at.% U. In the investigated range the liquid solution is
in equilibrium with the phases of the binary systems $ThBi_2$ and

UBi_2. There are 4 figures, 4 tables and 3 non-Soviet-bloc refe-

rences. The references to the English-language publications read
as follows: R. Ferro, Acta Cryst., 10, 7, 476-477 (1957); Metals
Abstr., 85, 806, (1957).

Card 2/2

S/179/62/000/005/004/012
E191/E135

AUTHORS: Rovinskiy, B.M., and Rybakova, L.M.   (Moscow)

TITLE: On the stresses and irreversible deformations in
             ductile metals in simple extensions

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye tekhniches-
             kikh nauk. Mekhanika i mashinostroyeniye, no.5, 1962,
             68-74.

TEXT: An experimental study was made on cylindrical
specimens with symmetrically arranged flats of commercially pure,
vacuum annealed Cu, Al, Ni, Armco iron and 0.45% carbon steel,
to obtain more reliable data than hitherto on the relation between
the true stress and the residual (irreversible) deformation. All
tests were conducted at the same rate of deformation on a tensile
test machine; these were so arranged that the true stress could be
plotted against the residual relative elongation and against the
residual relative reduction of area. Simultaneously, hardness
tests and metallographic examination were also carried out.
Several graphs are reproduced wherein the true stress is plotted
against the square root of the residual relative elongation

Card 1/3

On the stresses and irreversible... S/179/62/000/005/004/012
E191/E135

because a linear plot was forecast by earlier theories based on X-ray observations of the size of sub-grains and blocks. The diagrams show sometimes a single line and sometimes two lines. The slope of this line (or lines) is the coefficient of plasticity. A discussion shows that, in certain materials, the coefficient of plasticity and the Brinell hardness are functions of the elastic limit. It is remarkable that in copper and nickel of a certain structure the nominal elastic limit can be negative. The conclusion is derived that the graphs of the true stress against the total longitudinal relative deformation and against the total transverse relative deformation are well rendered by expressions in which the deformation has an elastic component proportional to the true stress and a plastic component proportional to the square of the plastic stress (i.e. the true stress less the elastic limit). The transverse deformation is rendered by a similar expression wherein the elastic and plastic terms are each multiplied by a (different) Poisson's ratio. In both expressions, the (reciprocal) Young's modulus is the factor in the elastic term, and the (reciprocal) square of the coefficient of plasticity in Card 2/3

On the stresses and irreversible ...   S/179/62/000/005/004/012
E191/E135

plastic term. It is shown that, from the initial values of the
coefficient of plasticity and of the hardness, the limiting values
can be easily obtained. The mechanical condition of a material
can be described by the relative hardness and the relative
plasticity.

There are 7 figures and 2 tables.

SUBMITTED: May 7, 1962

Card 3/3

S/129/63/000/001/010/017
E073/E551

AUTHORS: Rybakova, L.M. and Merenkova, R.F., Engineers

TITLE: Yield plateau in commercial nickel

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov,
               no.1, 1963, 29-30 and 34

TEXT: Under certain conditions the stress-strain curve of
polycrystalline commercial nickel has a yield plateau. 12 mm dia.
test specimens, a gauge length 100 mm, were produced from 20 mm
diameter metal of the following compositions:

	C	Fe	Cu	Si	Mn
			in %		
a	0.1	0.09	0.2	0.002	0.01
b	0.03	0.10	0.2	0.002	0.04

2 mm flat surfaces were ground on two opposite sides and electro-
lytically polished prior to the experiment. After annealing in
vacuo at 900°C for 2 hours the specimens were extended in a
tensile machine, metallographic and X-ray examinations being made
before and after extension. Some specimens after vacuum annealing
remained as bright and smooth as after electropolishing, whilst
the surface of others was covered with many dark spots; individual
Card 1/2

... of Machines GKAM SM USSR)

L 18078-63   EWP(q)/EWT(m)/BDS   AFFTC/ASD   Pad   JD/HW
S/0126/63/016/001/0107/0112

ACCESSION NR: AP3004599

AUTHORS: Ry*bakova, L. M.; Nikitina, I. I.

TITLE: Study of time-strength relations in nickel-aluminum and copper-aluminum alloys

SOURCE: Fizika metallov i metallovedeniye, v. 16, no. 1, 1963, 107-112

TOPIC TAGS: Ni-Al, Cu-Al, time-strength relation

ABSTRACT: The investigation included: 1) the behavior of Ni-Al and Cu-Al alloys subjected to the durability test; 2) structural state of the metal at its failure; and 3) the evaluation of work (W) required for metal failure. The sample composition was: Ni samples with 0, 2.8, 4.1 and 6.2% by weight of Al, and Cu samples with 0, 3.1, 6.2 and 8.2% by weight of Al. The samples were subjected to tensile stresses at various elongation speeds at room temperature. The results obtained are shown on graphs with log τ as ordinates and $\bar{S}$ or $\bar{W}$ as abscissas (τ- durability; $\bar{S}$ - average effective true stress at a cross section in time; W-work). It was established that metals can be divided into three groups: 1) those with strength-time relation expressed by a straight line on semilogarithmic coordinates; 2) those which age in time (the curve line log τ -$\bar{S}$ curves toward large values of $\bar{S}$); and 3) those for which curves logτ -$\bar{S}$ or lnτ -$\bar{W}$ deviate toward smaller values of $\bar{S}$ or $\bar{W}$. These

Card 1/2

L 18078-63

ACCESSION NR: AP3004599

2

deviations may be caused by technological defects or by heterogeneity in the alloy concentration. They indicate that the metal is unfit for long-term service. "The authors express their appreciation to B. M. Rovinskiy for his attention and interest in this work." Orig. art. has: 8 figures and 2 formulas.

ASSOCIATION: Institut mashinovedeniya (Institute of Machines Sciences)

SUBMITTED: 03Oct62   DATE ACQ: 27Aug63

SUB CODE: ML   NO REF SOV: 006

ENCL: 00

OTHER: 000

Card 2/2

RYBAKOVA, L.S.; FEDOROVA, M.K.

Rupture of aneurysms of the cerebral arteries. Kaz. med. zhur.
no.6:24-28 N-D '63.   (MIRA 17:10)

1. Kafedra nevrologi⁺ (zav. - prof. I.I. Rusetskiy) i 1-ya
kafedra terapii (zav. - prof. L.M. Rakhlin) Kazanskogo gosu-
darstvennogo instituta dlya usovershenstvovaniya vrachey imeni
Lenina.

RUSETSKIY, I.I.; RYBAKOVA, L.S.

Tonic positions of the hand in pyramidal insufficiency
syndrome. Zhur. nevr. i. psikh. 63 no.6:824-827 '63.
(MIRA 17:6)

1. Institut usovershenstvovaniya vrachey, Kazan'.

TEYTEL'MAN, M.A.; RYBAKOVA, L.V.

Treatment of acute pyodermas with erythromycin. Sov. med. 25 no.10:
136-137 O '61.   (MIRA 15:1)

1. Iz polikliniki imeni 15-y godovshchiny Oktyabrya (glavnyy vrach
I.S. Khoroshev), Sverdlovsk.
            (SKIN--DISEASES)   (ERYTHROMYCIN)

BIRYUKOVA, V., nauchnyy sotrudnik; RYBAKOVA, M., kand. biol. nauk.

Biological investigation of the development of crops on fields where chemical weed control is applied. Nauka i pered. op. v sel'khoz 8 no.12:54-55 D '58.   (MIRA 12:1)
          (Field crops) (Herbicides).

RYBAKOVA M.

PRAKSIN, S., kand. sel'skokhozyaystvennykh nauk; RYBAKOVA, M., kand. biol. nauk.

Biological investigation of the growth and development of winter wheat sown in the spring with vetch and oats. Nauka i pered. op. v sel'khoz. 8 no.3:49-51 Mr '58.
(MIRA 11:3)

1. Institut zemledeliya tsentral'nykh rayonov nechernozemnoy polosy.
(Wheat)

RYBAKOVA, M., inzhener.

Technical Control Division and the struggle for quality production.
Prom.koop.   no.4:37-38   Ap '57.   (MLRA 10:7)

1. Tekhnicheskoye upravleniye Rospromsoveta.
                          (Quality control)

L 46284-66   EWT(m)/EWP(w)/T/EWP(k)/EWP(t)/ETI   IJP(c)   JD/HW
ACC NR: AP5025328   SOURCE CODE: UR/0126/65/020/003/0424/042

AUTHOR: Zubov, V. Ya.; Grachev, S. V.; Rybakova, M. F.; Kir'yanova, N. P.

ORG: Ural Polytechnic Institute im. S. M. Kirov (Ural'skiy politekhnicheskiy institut)

TITLE: Problems of "heredity" of properties from thermomechanical treating of steel

SOURCE: Fizika metallov i metallovedeniye, v. 20, no. 3, 1965, 424-427

TOPIC TAGS: mechanical heat treatment, spring steel, metal property , annealing, tempering, durability, elasticity, hardness, toughness

ABSTRACT: The effect of additional tempering and annealing on thermomechanically treated, samples of spring strip was studied and the secondary treatment was shown to eliminate the favorable effects of the thermomechanical process. Samples of 0.4 x 4mm EI142 and U7A steel strip were austenized at 900C, precooled at 320C, rolled, and additionally austenized at 860C and 7.2 m/min rate for approximately 30 sec, or at 860C in oil. Prior to the additional tempering some samples were annealed at 450—550C or at 300C. All samples, either after the primary thermomechanical treatment or after the additional heat treatment, were annealed 1—5 min at 200—500C and tested for strength, elasticity, toughness, and hardness. Samples, which had been tempered and annealed, but not mechanically treated, were similarly tested.

UDC: 669.14.018.295

Card 1/2

L 40294-66

ACC NR: AP5025328

Additional heat treating decreased the mechanical properties and the amount of residual austenite to the level of strips obtained by ordinary heat treating. Thus, no retention of favorable properties occurs in the additional tempering process, whereas some unfavorable properties are preserved, causing an increase in brittleness at low annealing temperatures. Orig. art. has: 4 figures and 1 table.

SUB CODE: 11/ SUBM DATE: 24Sep64 / ORIG REF: 009/ OTH REF: 001

Card 2/2

ZUBOV, V.Ya.; GRACHEV, S.V.; RYBAKOVA, M.F.; KIR'YANOVA, N.P.

"Hereditary" properties of thermomechanically treated steel.
Fiz. met. i metalloved. 20 no.3:424-427 S '65.

(MIRA 18:11)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova.

VARENITSA, Ye.T., kand.sel'skokhozyaystvennykh nauk; MAR'YAKHINA, I.Ya.,
    kand.biol.nauk; RYBAKOVA, M.I., kand.biol.nauk.

    Biological investigation of the growth and development of recently
    introduced plants. Nauka i pered.op.v sel'khoz. 7 no.9:33-35 S '57.
                                                    (MIRA 10:10)

              (Millet)   (Growth (Plants))

RYBAKOVA, M.I.

Role of oligosaccharides and their dynamics in evaluating the winter hardiness of vairous forms of winter wheat and rye.
Dokl. AN SSSR 148 no.1:217-218 Ja '63.   (MIRA 16:2)

1. Predstavleno akademikom A.L. Kursanovym.
   (Oligosaccharides) (Plants—Frost resistance) (Grain)

25-9-9/40

RYBAKOVA MI

AUTHOR: Kuperman, F.M., Doctor of Biological Sciences, Mar'yakhina, N.Ya., Candidate of Biological Sciences, Rybakova, M.I., Candidate of Biological Sciences

TITLE: Regularities in the Development of a Plant (Zakonomernosti razvitiya rasteniya)

PERIODICAL: Nauka i Zhizn', 1957, # 9, p 17-20 (USSR)

ABSTRACT: The article deals with the different stages in the vegetation period of plants. Studies to this effect were especially intensified in the first three decades of the XX-th century. Soviet scientists had an important share in the development of theories in the field of ontogeny of higher plants. Important are the works of the following scientists: A.N. Beketov, K.A. Timiryazev, V.A. Palladin, N.P. Krenke, V.N. Lyubimenko, N.A. Maksimov and N.T. Kholodnyy. Of special importance are the works of I.V. Michurin and the scientific research conducted by T.D. Lysenko which led to the theory on the development of plants by certain stages. It was proved that a series of basic conditions were necessary to warrant the normal growth of a plant in each stage, such as favorable temperature, the right

Card 1/2

RYBAKOVA, M. I. Doc Cand Biol Sci -- (diss) "Characteristics

of the development and the growth of oats and millet kinds *varieties*

under various light conditions." Mos, 1957. 21 pp incl. covers

20 cm. (Moscow City Pedagogical Inst im V.P. Potemkin), 100

copies

(KL, 21-57, 100)

-33-

RYBAKOVA, M.I.

Study of the effect of different light conditions on the development and growth of oats in relation to geographic origin. Trudy Inst.fiziol.rast. 10:286-298 '55.   (MLRA 8:9)

1. Laboratoriya biologii rasvitiya rasteniy kafedry darvinizma Moskovskogo gosudarstvennogo universiteta im. M.V. Lomonosova. (Oats)
     (Plants, Effect of light on)

RYBAKOVA, M.I.

KUPERMAN, F.M., doktor biol. nauk; MAR'YAKHINA, N.YA., kand. biol. nauk;
RYBAKOVA, M.I., kand. biol. nauk.

Features in the development of plants. Nauka i zhizn' 24 no.9:17-20 S
'57.   (MIRA 10:9)
(Growth (Plants))

S/079/60/030/04/38/080
B001/B016

S.3400

AUTHORS: Lapkin, I. I., Rybakova, M. N.

TITLE: Reactions of Metallic Halide Alcoholates. VII. Reaction of
             Magnesium Halide Carbinolates of Tertiary Alcohols With
             Esters

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 4, pp. 1227-1230
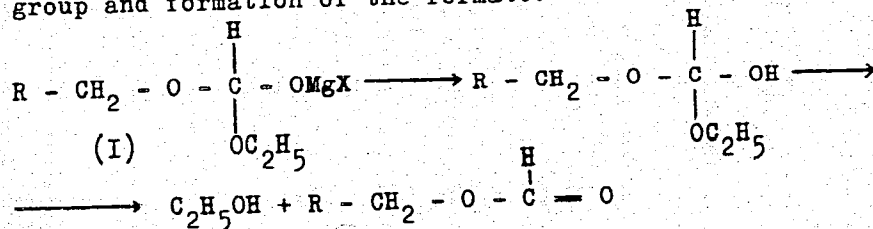
TEXT: In continuation of the papers of Refs. 1-13 dealing with the above
reactions, the authors made use of the fact that the excess in one of
the reactive products or a third component artificially introduced into
the reaction may change the direction of organomagnesium reactions, with
a view of regulating the reactions of ketones with organomagnesium
compounds, in order to obtain unsaturated hydrocarbons instead of alco-
hols. Ethyl formic and ethyl oxalic esters were used as the third
component introduced. The unsaturated hydrocarbons synthesized in this
way are mostly contaminated by the initial products. In order to deter-
mine the real course of reaction and the nature of the end products, also
magnesium halide carbinolates were allowed to react which were obtained

Card 1/3

Reactions of Metallic Halide Alcoholates.   S/079/60/030/04/38/080
VII. Reaction of Magnesium Halide Carbinolates   B001/B016
of Tertiary Alcohols With Esters

from pure carbinols with ethyl formate. The results given in the table
show that magnesium bromide alcoholates of the tertiary aliphatic and
aliphatic-aromatic alcohols give unsaturated hydrocarbons, and partly
bromides, when treated with equimolecular quantities of ethyl formate.
Alcoholates of tertiary alcohols with two aryl radicals are readily
converted to the unsaturated hydrocarbons under the influence of the
same ester (Ref. 25). The reaction of magnesium halide alcoholates of
primary alcohols with ethyl formate yields the stable compound (I)
which is converted by dilute acid to the unstable ester of orthoformic
acid, the stabilization of which occurs under separation of the ethoxy
group and formation of the formate:

$$R - CH_2 - O - \overset{\overset{\displaystyle H}{|}}{\underset{\underset{\displaystyle OC_2H_5}{|}}{C}} - OMgX \longrightarrow R - CH_2 - O - \overset{\overset{\displaystyle H}{|}}{\underset{\underset{\displaystyle OC_2H_5}{|}}{C}} - OH \longrightarrow$$

(I)

$$\longrightarrow C_2H_5OH + R - CH_2 - O - \overset{\overset{\displaystyle H}{|}}{C} = O$$

Card 2/3

Reactions of Metallic Halide Alcoholates.   S/079/60/030/04/38/080
VII. Reaction of Magnesium Halide Carbinolates   B001/B016
of Tertiary Alcohols With Esters

The magnesium halide alcoholates of tertiary alcohols form with
formates a less stable compound of type (I) which is stabilized under
formation of unsaturated hydrocarbons (principal reaction) and of
bromides (side reaction). The side reaction becomes the principal
reaction by reaction with magnesium halide diaryl carbinolates (Refs. 13,
25) (Scheme 2). Some novel aliphatic-aromatic tertiary alcohols and
unsaturated hydrocarbons have thus been synthesized and described. There
are 1 table and 25 references, 4 of which are Soviet.

ASSOCIATION: Permskiy gosudarstvennyy universitet (Perm' State University)

SUBMITTED: March 2, 1959

Card 3/3

RYBAKOVA, M.N.

LAPKIN, I.I.; RYBAKOVA, M.N.

Reactions of metal halide alcoholates. Part 4: Reactions of zinc halide alcoholates of primary and secondary aromatic alcohols with esters. Zhur. ob. khim. 27 no.8:2232-2234 Ag '57.(MLRA 10:9)

1. Molotovskiy gosudarstvennyy universitet.
         (Alcoholates)   (Zinc organic compounds)

LAPKIN, I.I.; RYBAKOVA, M.N.

Reactions of metal halide alcoholates. Part 8: Control of
organomagensium reactions. Zhur.ob.khim. 30 no.8:2674-2677
Ag '60.   (MIRA 13:8)

1. Permskiy gosudarstvennyy universitet.
                    (Magnesium organic compounds)
                    (Alcoholates)

RYBAKOVA, M.N.

LAPKIN, I.I.; LAPKINA, O.M.; RYBAKOVA, M.N.

Reactions of metal halide alcoholates. Part 5: Reaction mechanism of magnesium halide alcoholates with esters. Zhur.ob.khim. 28 no.2:391-398 F '58.   (MIRA 11:4)

1.Permskiy gosudarstvennyy universitet.
          (Alcoholates) (Magnesium compounds) (Malonic acid)

RYBAKOVA, M.N.

Distr: 4E4j

Reactions of halometal alcoholates. IV. Reactions of halometal alcoholates of primary and secondary aromatic alcohols with esters. I. I. Lapkin and M. N. Rybakova (State Univ., Molotov). Zhur. Obshchei Khim. 27, 2232-1 (1957); cf. C.A. 50, 3356b.—To a suspension of powd. $ZnCl_2$ under Et_2O was added an equimolar amt. of $EtMgBr$ and after refluxing 1 hr. the resulting soln. of $EtZnCl$ was treated with a desired carbinol, refluxed 0.5 hr., treated with desired ester, heated as needed 3–12 hrs. and treated with aq. AcOH. Thus were obtained the following results: $Ph_2CHOZnCl$ and HCO_2Et gave 100% $Ph_2CHOCHPh_2$, m. 110°; $(EtO_2C)_2$ gave 100% of the same ether, but $(EtO_2CCH_2)_2$ gave 100% initial carbinol; $CH_2(CO_2Et)_2$ gave 70% original carbinol and 30% dibenzhydryl ether; $BtOEt_2$ gave 100% dibenzhydryl ether; Et_2SO_4 gave 30% above ether and 70% original carbinol, but EtOAc gave 100% carbinol recovery. Di-p-tolylcarbinol and EtO_2CH gave 33% original carbinol and 67% bis[di(p-tolyl)carbinyl]ether (I), m. 186°; the reaction of $(CO_2Et)_2$ in this case gave 100% I, while the reaction with $CH_2(CO_2Et)_2$ gave 33% I and 67% carbinol. Reaction with $2-(C_{10}H_7)_2CHOH + HCO_2Et$ gave 46% carbinol, and 54% bis[di(2-naphthyl)carbinyl] ether, m. 247°; that with $(CO_2Et)_2$ gave 35% ether and 65% carbinol, in a short run, while in longer runs (up to 12 hrs.) the yield of the ether rose to 100%. G. M. Kosolapoff

RYBAKOVA (?) N.

79-2-25/64

AUTHORS: Lapkin, I. I. , Lapkina, O. M. , Rybakova, M. N.

TITLE: Reactions of Metal Halide Alcoholates (Reaktsii galoidmetallalko-
             golyatov) V. Mechanism of the Interaction of Magnesium Halide
             Carbinolates With Esters (V. Mekhanizm vzaimodeystviya galoidmag-
             niykarbinolyatov so slozhnymi efirami)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 2, pp. 391 - 398 (USSR)

ABSTRACT: The authors began the present work with the aim of determining the
             number of orthosubstituents in which hydrocarbons of the type of
             diarylmethane form instead of haloidides. The investigations car-
             ried out with magnesium halide diarylcarbinolates with a gradual
             increase in the number of orthosubstituents showed that in case of
             a number of substituents smaller than four this reaction leads to
             the formation of diarylmethylhaloidides. It is assumed that the
             formation of diarylmethanes will take place in three secondary and
             tertiary radicals which are, however, more complicated than methyl.
             The problem was, however, not yet solved by the authors. Oxalic
             acid esters react with magnesium halide diarylcarbinolates analo-
             gous to formic acid esters. A deviation is only observed in the
             case of magnesium halide diarylcarbinolate with 4 occupied ortho-
             -positions, as the carbinol is regenerated in the separation of
Card 1/3   the products of their interaction with diethyloxalate, water and

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acid. In connection with the results of the present and earlier works the problem concerning the mechanism of the reaction of magnesium halide carbinolates with esters (references 1-3) rises. Its solution might contribute toward anticipating new forms of transformation of magnesium halide carbinolates as well as toward explanation of the nature of numerous anomalies which are observed in organic magnesium reactions. The occurrence of anomalies is the consequence of a side reaction between the initially formed magnesium halide alcoholates and esters. The authors found the conditions for the elimination of haloidides by means of interaction of magnesium halide diarylcarbinolates with esters. In this connection the yield of the haloidides is as well dependent on the nature of diarylcarbinoles as on the nature of the esters. Numerous tests for the investigation of the reaction of the magnesium halide phenolates and magnesium halide naphthalates with esters showed that the phenolates and naphthalates, in contrast to the alcoholates, have no interaction with esters. Summary: 1) The authors suggested the investigation of the reaction of magnesium halide diarylcarbinolates with esters. It was found that only the magnesium halide diarylcarbinolates with formic acid esters form diarylmethanes in

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which all four ortho-positions are occupied. In the case of a smaller substitution these reactions lead to the formation of diaryl-methylhaloidides. 2) It was shown in new examples that in the interaction with esters of malonic acid magnesium halide diarylcarbinolates are converted to diarylmethylethers. 3) It was found that magnesium bromide phenolates and magnesium bromide naphthalates do not react with esters of formic, oxalic, sulfuric and succinic acid in the case of equal molecular quantities under assumed reaction conditions. 4) The mechanism of the interaction of magnesium halide alcoholates and esters was investigated. There are 1 table, and 11 references, 7 of which are Slavic.

ASSOCIATION: State University, Perm' (Permskiy gosudarstvennyy universitet)

SUBMITTED: January 8, 1957

AVAILABLE: Library of Congress

Card 3/3

RYBAKOVA, M. N., Cand Chem Sci -- "Haloid-magnesium and haloid-zinc alkyls with esters." Sverdlovsk, 1961. (Min of Higher and Sec Spec Ed RSFSR. Ural Polytech Inst im S. M. Kirov) (KL, 8-61, 231)

32253
S/103/61/022/012/010/016
D201/D305

16.4000 (1031)

AUTHOR: Rybashov, M. V. (Moscow)

TITLE: Electronic analogue determination of roots of a system of finite equations using variable structure differential equations

PERIODICAL: Avtomatika i telemekhanika, v. 22, no. 12, 1961, 1638-1648

TEXT: Ashby W. Ross's concept of random search for a structure with stable motion (Ref. 1: Design for a Brain, New York, 1952) is used by the author for finding the roots of a system of finite equations

$$f_i(y_1, \ldots, y_n) = 0 \quad (i = 1, \ldots, n) \tag{1}$$

with the help of an electronic analogue. The required system of differential equations is sought in the form of

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Electronic analogue determination ...

$$\frac{dx_i}{dt} = F_i(f_1,\ldots,f_n, \; \mathcal{E}_1,\ldots\mathcal{E}_r) \quad (i = 1,\ldots,n) \qquad (2)$$

where $\mathcal{E}_1(t),\ldots,\mathcal{E}_r(t)$ are step functions of time which assume values from a certain multiplicity E_x and at points of discontinuity $\mathcal{E}_i(\bar{t}_k)$ $= \mathcal{E}_i(\bar{t}_k - 0)$; the functions F_i are continuous over all f_i and $\mathcal{E}_k$ and such that for any i $F_i(0,\ldots, 0, \; \mathcal{E}_1,\ldots,\mathcal{E}_r) = 0$ and $F_i(f_1,\ldots,$ $f_n, \; \mathcal{E}_1,\ldots, \; \mathcal{E}_r) \neq 0$ if any one of functions f_i differs from zero. $x_1,\ldots,x_n$ in system (2) and throughout the rest of the article denote deflections from any arbitrary rest point, corresponding to one of the roots of system (1). The system of differential equations with a time-varying structure and fixed rest points thus obtained is solved by an analogue. The solution is controlled by the conditions of the asymptotic stability of the rest point theorem. When these conditions cannot be satisfied, one particular

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structure has to be determined, belonging to a certain finite set, for which structure the theorem conditions are satisfied which makes it possible to obtain the conveyance of the process towards one of the roots of the fundamental system. The method was applied for the experimental solution of a system of algebraic non-linear equations

$$f_1 = x_1^2 - 0,01 \left[4,16 - 3,73x_2 - (x_1 + x_2 + x_3)^2 \right] = 0,$$

$$f_2 = x_2^2 - 0,01 \left[4,16 - 3,73x_2 - (x_1 + x_2 + x_3)^2 \right] = 0,$$

$$f_3 = x_3^2 - 0,17 \left[4,16 - 0,93x_2 - (x_1 + x_2 + x_3)^2 \right] = 0 \qquad (18)$$

on analogues ЭМУ-8 (EMU-8) and МН-7 (MN-7). The system of differential equations was set at the analogue in the form of

$$\dot{x}_i = \mathcal{E}_i f_i \quad (i = 1,2,3, \quad \mathcal{E}_i = \pm 1) \qquad (19)$$

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The function V, positive everywhere except at point $f_1 = f_2 = \ldots = f_n = 0$ at which $V(f_1, \ldots, f_n) = 0$ was of the form $V = c(f_1^2 + f_2^2 + f_3^2)$, $c < 0$ and was obtained with thyrite squarers of the analogue EMU-8. The total differential V was obtained by a differentiator. The oscillograms in Figs. 5 and 6 illustrate the search of two different roots. The relative error in root determination is about 2%. Error referred to the 100 V analogue scale is less than 1%. The search time depends on integrating constants and varies from 0.1 to 2 sec. The following is stated in conclusion: 1) The variable structure method can be applied for determining roots of a system of finite equations. The search procedure may utilize units of standard analogues, provided they possess a differentiator; 2) the solution does not require any transformation of functions of the fundamental system which are necessary e.g. in the gradient method; 3) the suggested method is strongly recommended for solving systems of transcendental equations and of systems of linear algebraic equations, for which the evaluation of the basic coefficient matrix

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$$W = \beta V \sum_{i=1}^{n} \left| \frac{\partial V}{\partial x_i} \right| \quad (0 < \beta \leqslant 1) \qquad (12)$$

is not necessary. There are 6 figures and 12 references: 8 Soviet-bloc and 4 non-Soviet-bloc. The reference to the English-language publication reads as follows: Ashby W. Ross. Design for a Brain, New York, 1952.

SUBMITTED: May 10, 1961

Card 5/6

SAPARGALIYEV, G.S., kand. yurid.nauk;PAL'GOV,N.N., akad.; BOGATYREV, A.S.;
    AFANAS'YEV, A.V., prof.; BYKOV, B.A.; SHAKHMATOV, V.F., kand. istor.
    nauk; POKROVSKIY, S.N., akad.; SAVOS'KO, V.K., kand. istor. nauk;
    NUSUPBEKOV, A.N., kand. istor. nauk; BAISHEV, S.B., akad.; GOROKH-
    VODATSKIY, I.S., kand. istor. nauk; AKHMETOV, A., kand. istor. nauk;
    RAKHIMOV, A., kand. istor. nauk; PIVEN', N.F.; CHULANOV, G.Ch., doktor
    ekonom. nauk; BOROVSKIY, V.A., kand. ekonom. nauk; SYDYKOV, A.S., kand.
    pedagog. nauk; ZHANGEL'DIN, T., kand. filos. nauk; KARASAYEV, L.K.;
    KANAPIN, A.K., kand. istor. nauk; BELENOV, M.D., kand. ekonom. nauk;
    KARYNBAYEV, S.R., kand. med. nauk; AKHMETOV, K.A.,; SMIRNOVA, N.S.,
    doktor filolog.nauk; SIL'CHENKO, M.S., doktor filolog. nauk; YERZA-
    KOVICH, B.G., kand. iskusstvovedcheskikh nauk; RYBAKOVA, N.; MUKHTA-
    ROV, A.I.; BOGATENKOVA, L.I.; KUNDAKBAYEV, B.; SIRANOV, K.S.; SHVYD-
    KO, Z.A., red.; MAMTSOVA, L.B., red.; ZLOBIN, M.V., tekhn. red.

[The Soviet Kazakh Socialist Republic] Kazakhskaia Sovetskaia So-
tsialisticheskaia Respublika. Alma-Ata, Kazakhskoe gos. izd-vo,
1960. 477 p.   (MIRA 14:6)

1. Akademiya nauk Kaz.SSR (for Pal'gov, Pokrovskiy, Baishev)
2. Chlen-korrespondent Akademii nauk KazSSR (for Bykov, Smirnova,
Sil'chenko)
                        (Kazakhstan)

ZIL'BERMAN, Ye.N.; RYBAKOVA, N.A.

Catalytic action of zinc chloride in Gesh synthesis.
Zhur.ob.khim. 32 no.2:591-596 F '62.   (MIRA 15:2)
                        (Zinc chloride)
                        (Catalysis)

RYBAKOUP, N.A.

AUTHORS: Kurilenko, A. I., Kul'kova, N. V.,   76-32-4-11/43
              Rybakova, N. A., Temkin, M. I.

TITLE: The Oxidation of Ethylene to Ethylene Oxide on a
              Silver Catalyst (Okisleniye etilena v okis' etilena na se-
              rebryanom katalizatore).
              I. Experimental Investigation of the Reaction Kinetics
              I. Eksperimental'noye izucheniye kinetiki reaktsii)

ABSTRACT: Since the hitherto made investigations of the reaction
              mentioned in the title supplied different contradicting
              results the investigations mentioned in this paper were
              carried out by means of the method of continuous circu-
              lation. This method offers the following advantages: The
              reaction velocity is measured directly as function of
              the concentrations. The desired temperature in the re-
              action zone is secured in spite of the great heat effect
              of the process. Any form of catalyst can be used, without
Card 1/4   making it possible to the gas to pass by without touching

The Oxidation of Ethylene to Ethylene Oxide on a   76-32-4-11/43
Silver Catalyst. I. Experimental Investigation of the
Reaction Kinetics

the catalyst. The possibility of the formation of ex-
ternal diffusion effects is reduced. From the experimen-
tal part from a diagram can be seen among other that the
reaction vessel is a vertical glass tube in which the ca-
talyst is located (spongy silver in form of tablets). A
circular glass tube connected to the reaction vessel and
a circulation pump introduce the gas mixture or drain it.
Mostly the obtained ethylene oxide was frozen at $-78^{\circ}C$
and determined according to Lubatti (Reference 9). The
results obtained show among other that in the first 7o-8o
hours the activity of the catalyst decreases and the se-
lectivity increases (shown graphically). The two reaction
velocities of ethylene oxide formation and of carbon dio-
xide and water formation are dealt with separately. The
experiments were carried out with different gas concen-
trations, that is to say, ethylene 0.6 - 7o%, oxygen
1.5 - 9o%, ethylene oxide 0.3 - 3%, carbon dioxide 0.1 - 85%
in order to determine the reaction kinetics. The results
Card 2/4   obtained are mentioned on some tables for different cata-

The Oxidation of Ethylene to Ethylene Oxide on a   76-32-4-11/43
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lyst samples. The two above mentioned reactions show
reaction velocities which are calculated according to
analogous equations. The observation that the freezing
of ethylene oxide within the cycle does not change se-
lectivity is in coincidence with some other references;
the contradiction to the data by O. M. Todes and T. I.
Andrianova (Reference 4) is explained by the longer con-
tact time used by them. An impeding effect of the oxi-
dation products on both reaction velocities was obser-
ved. The statement that in freezing ethylene oxide and
water the reaction velocity sharply increases was already
mentioned by Ya. B. Gorokhovatskiy and M. Ya. Rubanik
(Reference 11). The raise of temperature effected a de-
crease in the yield of ethylene oxide. The activation
energies were calculated and mentioned to be 152oo cal
for the formation of ethylene oxide and 198oo cal for
the formation of carbon dioxide and water.
There are 6 figures, 7 tables and 11 references, 7 of
Card 3/4   which are Soviet.

The Oxidation of Ethylene to Ethylene Oxide on a   76-32-4-11/43
Silver Catalyst. I. Experimental Investigation of the
Reaction Kinetics

ASSOCIATION: Fiziko-khimicheskiy institut im. Karpova, Moskva
               (Moscow Physicochemical Institute imeni karpov)

SUBMITTED: December 1, 1956

AVAILABLE: Library of Congress

               1. Ethylene--Oxidation   2. Silver catalysts--Applications

Card 4/4

RYBAKOVA, N.A.; ZIL'BERMAN, Ye.N.

Synthesis of some new hydroxy ketones by the Hoesch method.
Zhur.ob.khim. 33 no.2:466-469 F '63.   (MIRA 16:2)
(Ketones)

ZIL'BURMAN, Ye.N. (Dzerzhinsk); RYBAKOVA, N.A. (Dzerzhinsk)

New catalysts for the Hoesch reaction. Kin. i kat. 5 no.3:538-540
My-Je '64.   (MIRA 17:11)

ZIL'BERMAN, Ye.N.; RYBAKOVA, N.A.

    Hoesch synthesis. Synthesis of benzoresorcinol. Zhur.ob.
khim. 30 no.6:1992-1996 Je '60.   (MIRA 13:6)
              (Resorcinol)

BERLIN, A.A.; ZIL'BERMAN, Ye.N.; RYBAKOVA, N.A.; SHARETSKIY, A.M.;
YANOVSKIY, D.M.

Investigation of some epoxide stabilizers of polyvinyl-
chloride. Zhur.prikl.khim. 32 no.4:863-868 Ap '59.
(MIRA 12:6)

(Ethylene) (Ethers)

5(3), 15(9)   SOV/80-32-4-28/47

AUTHORS: Berlin, A.A., Zil'berman, Ye.N., Rybakova, N.A., Sharetskiy, A.M.
                and Yancvskiy, D.M.

TITLE: Investigation of Some Epoxide Stabilizers for Polyvinylchloride
                (Issledovaniye nekotorykh epoksidnykh stabilizatorov polivinil-
                khlorida)

PERIODICAL: Zhurnal prikladnoy khimii, 1959, Vol 32, Nr 4, pp 863-868 (USSR)

ABSTRACT: One of the real drawbacks of chlorine-containing polymers is their
                low resistance to the effects of heat and light.   Various
                stabilizers have been proposed for increasing their thermal
                resistance. The present article furnishes comparative data on the
                stabilizing effect of some commercial and newly synthesized (by the
                authors) compounds. The following stabilizers for polyvinylchloride
                have been synthesized and tested: low-molecular epoxide resins on
                the base of epichlorohydrin and 2,2-bis-(4-oxy-3-methylphenyl)-
                propane, 1,1-bis-(4-oxyphenyl)-cyclohexane, 1,1-bis-(4-oxy-3-
                methylphenyl)-cyclohexane and 2,2-bis-(4-oxy-3-nitrophenyl)-
                propane; cis-9,10-epoxybutyl stearate, epoxidized castor oil and
Card 1/2   sperm oil. It has been shown that these compounds, with exception